



# Economic Analysis of Sweet Potato Farming and Marketing in Odisha

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## Abstract

Sweet potato plays a crucial role in increasing food security and income for the poor farmers of Odisha. Sweet potato is grown during Kharif and Rabi season. It is consumed in different forms namely fresh, boiled and baked. The value chain of sweet potato is not well organized in Odisha. This study was carried out to analyze the existing sweet potato value chain in four selected districts of Odisha namely Koraput, Kalahandi, Kandhamal and Ganjam. Purposive sampling technique was used to select the samples and primary data were collected through well-structured questionnaire from different value chain actors. Simple descriptive statistics and econometric analysis were used to analysis the data. The value chain actors in sweet potato are Input suppliers, producers, aggregators, wholesalers, retailer and consumers. There are no specialized traders or retailers of sweet potato found in the study area. They mostly sell the sweet potato along with vegetables. There were no processing unit for sweet potato in Odisha. Farmer's producer organization (FPOs) and value addition will help in raising farmer's income and welfare.

**Key words:** Sweet potato, value chain, opportunities, Odisha

## Introduction

Sweet potato (*Ipomoea batatas*) ranks the seventh most important food crop of the world (Nedunchezhiyan and Ray, 2010) and it is an important subsistence farming of Asia and Africa (Krishnan et al., 2011). In the world, the production of sweet potato is 110.74 million tons and area under sweet potato cultivation is 8.24 million ha. Nearly 90 percent of the world production is from the developing countries; with China having the largest share of 72 percent (FAOSTAT, 2013). Sweet potato is an important tuber crops in India that plays a crucial role in agriculture, food and nutritional security of poor farmers (Nedunchezhiyan, 2014). Eventhough it is cultivated almost in all the states in India, it is largely grown in three states such as Odisha, Uttar Pradesh and West Bengal. The area under sweet potato cultivation is 0.10 million ha and the sweet potato production is 1.08 million tons (NHB, 2013). The state of Odisha is the

largest producers of sweet potato in India and it contributes to one-third of India's overall production (Campilan et al., 2007).

Value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, transformation and delivery to final consumers, and final disposal after use (Kaplinsky and Morris 2002). Value chain includes input suppliers, producers, processors, wholesalers, retailers and consumers. They are supported by a range of financial, business and financial service providers. It has been argued that efficient value chain would reduce the use of intermediaries in the chain, and strengthen the value added products with better technology and inputs, farm gate procurement, upgraded infrastructure and processing and exports (Miller and Jones, 2010).

Studies on value chain analysis of sweet potato in India is very limited. Few studies have found (Singh et al., 2014; Nedunchezhiyan, 2014) that deals with the performance of the sweet potato varieties and their nutritional value in India. Therefore, it is important to assess the roles and activities of these players have become an important issue for policy makers in taking decision to improve the sweet potato value chain. Keeping this background in mind, the present study were undertaken to map and understand the sweet potato value chain and their linkages among various players in the sweet potato value chain in Odisha.

### Materials and Methods

The study was conducted in four selected districts of Odisha namely Koraput, Ganjam, Kanthamal and Kalahandi. Purposive sampling technique was used to select the samples. The study areas were selected based on the area of sweet potato cultivation and production. The primary data were collected through well-structured questionnaire from different value chain actors. A separate questionnaire were prepared for each actor in the value chain. Simple descriptive statistics were used to analyse the data. The sample size is given in Table 1.

Table 1. Sampling framework

Sl. No	Particulars	Sample size
1	Producers	310
2	Aggregators	25
3	Wholesalers	12
4	Retailers	25
5	Consumers	142
	Total	514

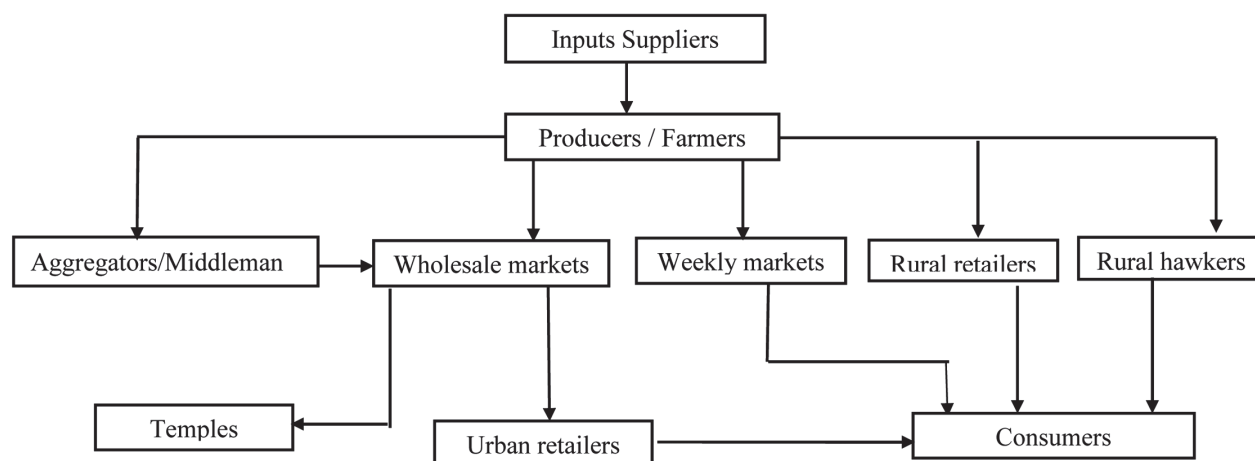
## Results and Discussion

### Mapping of the sweet potato value chain

The sweet potato value chain actors found in the study areas were input suppliers, producers, traders, retailers and consumers.

#### Sweet potato producers

Very few input suppliers we found in the study area were agro-input dealers and vine material suppliers. It was found that nursery preparation starts with two to three month prior to planting in the main field. The farmers raising nursery in the field for vine multiplication and who do not have vine materials are either purchasing or getting it free from others. Farmers were also unaware about the improved varieties of sweet potato in the study area. The farmers were mainly using fertilizers, farm-yard manures, pesticides and micro-nutrients. Most of the farmers they don't use the inputs in proper dose and they use very small quantity. The labours in the study areas are not plenty. Therefore during the peak season of transplanting and harvesting farmers face the shortage of labour. Sweet potato has become a cash crop for farmers, who consume a little portion of it and sell the rest. Although the production area of sweet potato is increasing, farmers mostly stated that sweet potato requires few inputs and returns are comparatively high. Price is determined by a number of factors. These are based on the demand in the market, production, festive season (if any), and the consumer mood. The farmers in this case are price-takers. Table 2 shows the average production of sweet potato during Kharif season was 32 quintal. Further the study found that average production



Source: Authors

Fig. 1. Sweet potato value chain mapping in study area

cost of sweet potato per kg is Rs.4.50/- while the average farm gate price of sweet potato is Rs.9.75/-. Analysis also showed that sweet potato producers got the profit of Rs.17018/- per acre.

Table 2. Economics of sweet potato at producers' level

Particulars	Amount (₹)
Cost of production of sweet potato per kg	4.50
Farm gate price of sweet potato per kg	9.75
Total variable cost of production per acre	14182
Yield during Kharif season in 2015	32.00
Total value of sweet potato	31200
Profit per acre	17018

Source: Computation from value chain surveys, 2016, Odisha, India

#### Sweet potato traders

As sweet potato is a seasonal crop, we did not find any specialized traders for sweet potato trading in the study area. The traders we found during the study are basically the seller of seasonal vegetables. During harvesting of sweet potato, the traders come from different locations to purchase sweet potato from the farmer's field and also farmer's sells sweet potato directly to traders and retailers.

#### Sweet potato retailers

Sweet potato retailers are basically vegetable sellers. They buy in small quantity from traders and sometimes them directly purchases from the farmers. The retailer sells all the quantity to consumer on daily basis.

#### Sweet potato consumers

The consumer prefers to purchase mostly from retailers and sometimes from producers. The study revealed that consumers prefer both red skin and white skin variety of sweet potato because of its taste and tradition practice. The consumer's eats sweet potato in the form of fresh, boiled, baked and used to prepare delicacies. The most

common use of sweet potato in the study area were as morning breakfast, main meals and as evening snack.

#### Channels in the sweet potato value chain

According to Sorwar et al (2015) a marketing chain is used to describe the links that connects all the actors involved, ie moving the sweet potato product from input suppliers to final consumers. Very few channels for sweet potato was found in the study area. The following channels were identified as shown in Table 3.

Channel 1 : Farmers-Aggregators-Wholesalers-Retailers-Consumers

Channel 2 : Farmers-Wholesalers-Retailers-Consumers

Channel 3 : Farmers-Retailers-Consumers

Channels 4: Farmers-Consumers

#### Marketing costs and benefit share of actors in the sweet potato value chain

Table 4 shows different types of marketing cost associated with transaction of sweet potato by producers, aggregators, wholesalers and retailers and the benefit share of each actor. The arrangement of marketing cost revealed that transportation cost is the highest cost for each value chain actor. Thus the cost of transportation is the highest amount followed by loading and unloading costs. Each of the sweet potato value chain actors simply adds value to the product as the product moves from one actor to another actor. In this way, each actors change the form of the product through improving the grade by cleaning, sorting, sometime washing and time utility. As compared to producers, traders and retailers profit margins was much more than the farmers. By buying the sweet potato from the producers and selling to consumers, traders took 90 per cent of the total profit margin. While farmers, doing all the work of producing sweet potato and bearing the risks associated, took only 10 per cent of the profit margin. Thus the data indicated

Table 3. Marketing channel in the sweet potato value chain

No. of channel	Farmers	Aggregators	Wholesalers	Retailers	Consumers	Percentage
1						70
2						21
3						5
4						4

Source: Computation from value chain surveys, 2016, Odisha, India

Table 4: Price spread analysis

Item (Rs./quintal)	Producers	Aggregators	Wholesalers	Retailers	Sum
No. of observations	310	25	12	25	514
Purchase price	-	820.00	970.00	1116.00	2906.00
Production cost	443.04	-	-	-	443.04
Marketing cost					
Transportation cost	33.36	31.40	125.00	17.00	206.76
Sack & thread cost	23.14	9.72	3.41	0.00	36.27
Loading & unloading cost	8.58	28.40	9.16	5.80	51.94
Other costs	15.35	33.00	4.12	6.80	59.27
Total marketing cost	80.43	102.52	141.69	29.60	354.24
Total cost	523.47	102.52	141.69	29.60	797.28
Selling price	975.00	1156.00	1295.00	1869.00	5295.00
Marketing margin	531.96	336.00	325.00	753.00	1945.96
% share of margin	27.33	17.26	16.70	38.69	100.00
Profit margin	451.53	1053.48	1153.31	1839.40	4497.72
% share of profit	10.03	23.42	25.64	40.89	100.00
Producers share (%)	52.16	-	-	-	-

Source: Computation from value chain survey, 2016, Odisha, India

that the farmers paid heavily on the intermediaries. This allows a large margin of the prices to be cornered by the agents.

## Conclusion

Though sweet potato has become a cash crop for the growers, value chain of sweet potato is not well organized in Odisha to get the potential benefits out of it. Core value chain actors in sweet potato value chain are input suppliers, producers, aggregators, wholesalers, retailers and consumers. There are no specialized traders or retailers of sweet potato. The value chain is constrained by lack of market, lack of transportation and lack of storage among the chain actors. Farmers still follow traditional cultivation practices and are largely constrained by lack of awareness of improved cultural practices. Due to lack of awareness about the storage and post-harvest techniques, the product is sold immediately. The study suggested that through establishment of farmer's producer's organization and creation of value added products will help in providing better avenues for raising farmer's income and welfare. Besides helping the farming for acquiring quality planting materials, credit and inputs at cheaper rate the market system also need to be improved.

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